

CONFIRMED MINUTES

IHRA SIDE IMPACT WORKING GROUP

3rd MEETING

DETR, LONDON, ENGLAND

25-26 FEBRUARY 1999

ATTENDEES

Keith Seyer	Federal Office of Road Safety, Australia (Chair)
Craig Newland	Federal Office of Road Safety, Australia (Secretary)
Dainius Dalmotas	Transport Canada
Peter O'Reilly	DETR, UK
Richard Lowne	EC/EEVC
Joseph Kianianthra	National Highway Traffic Safety Administration, USA
Robert Hultman	AAMA
Rainer Justen	ACEA
Takahiko Uchimura	JAMA/Japanese Ministry of Transport
Hideki Yonezawa	Japanese Ministry of Transport
Risa Scherer	Chair - WorldSID Task Group

MINUTES OF THE PREVIOUS MEETING

The draft minutes of the second meeting, held in Phoenix Arizona were approved and confirmed without alteration.

Mr Kianianthra commented that the IHRA website had not yet been used. It was suggested that a photograph of the chairman be posted to the unprotected area of the website and that links to IHRA member bodies also be included. It was further suggested that copies of the minutes and working documents be posted to the password-protected area. The details of these items are to be resolved with John Hinch from NHTSA. Mr Newland to liaise with NHTSA to organise this.

WORLDSID TASK GROUP UPDATE

Ms Scherer presented an update on the activities of the WorldSID Task Group (refer document SIWG15). The timing for the WorldSID project has been revised and lengthened by 6 months. Proposals were due on 25 February 1999 and will be evaluated and selected 8-10 March 1999 in Ottawa, Canada.

During this presentation, Mr Lowne commented that the dummy responses are critical, because the dummy influences vehicle design, with possible exploitation of

any dummy deficiencies. Mr Lowne also noted that the following points were not detailed in the presentation by Ms Scherer:

- correct dummy / seat interaction is important
- the abdomen and pelvis should have no hidden load paths
- the seated height and leg length were important anthropometric parameters, but these do not necessarily correspond to the anthropometric standing height measurements of an 'average person'
- the biomechanical response of the lumbar spine is important.

Mr Lowne also commented that the WorldSID program may benefit from being delayed for 6-10 months in order to incorporate extra data expected to become available from IHRA and SID2000. He suggested that a subsystems test be considered for evaluating out of position airbag interaction. He also expressed concern that the "design freeze" scheduled for June 1999 could prohibit alternative and possibly superior designs from being incorporated in the WorldSID.

Ms Scherer agreed that the absence of hidden load paths should be a requirement for all body regions of the WorldSID. She indicated that the design freeze was intended to fix criteria and concepts, but not necessarily be design specific or restrictive, thereby allowing a certain degree of flexibility beyond the freeze date.

The Chairman then sought opinions on the WorldSID program from the IHRA delegates.

JAMA

Mr Uchimura confirmed JAMA's support for WorldSID as a harmonised dummy. He expressed concern over the full arms creating variability of results and suggested replacement partial arms to be used in dynamic tests. He agreed that a full arm would be desirable if it did not create other testing problems. Mr Uchimura expressed concern that the WorldSID may not be fully capable for the test specification(s) to be determined by IHRA unless there is full cooperation between the IHRA Side Impact and Biomechanics Working Groups (and the WorldSID Task Group via the IHRA Biomechanics group).

JMoT

The Japanese Ministry of Transport is committed to a harmonised regulation.

JAMA

JAMA has now fixed its budget and has agreed to commit funds for WorldSID in excess of its normal budget.

ACEA

Mr Justen did not wish to comment further to comments previously submitted to the ISO.

NHTSA

Mr Kianianthra stated that NHTSA were watching and waiting.

US INDUSTRY

Mr Hultman reiterated that the US industry is fully committed to WorldSID.

An informal discussion then took place. Ms Scherer stated that the WorldSID specification will be sent to the IHRA Side Impact Working Group for comment. Responses are due by 15 April 1999.

There was some concern expressed over the timelines for the IHRA Biomechanics and Side Impact Working Groups and WorldSID. It was suggested that it would be useful to assemble a document detailing timelines for all of these groups, however, it was agreed that a Terms of Reference for the IHRA Side Impact Working Group would need to be developed before discussing timelines.

The question of the provision of anthropometric specification for the WorldSID was raised. The IHRA Biomechanics Working group has assigned the anthropometric review task to Mr Seyer and the Federal Office of Road Safety. There has been limited progress on this task to date. Mr Kianianthra suggested that Mark Haffner from NHTSA would have some useful information to assist this task. Ms Scherer also suggested the CAESAR project may provide some input. Mr Newland undertook to follow up both of these contacts. Mr Seyer gave a commitment to complete this task as soon as possible.

DEVELOPMENT OF TERMS OF REFERENCE

The Chairman commented that accident data had been previously presented by each of the regions and that this data highlighted the significance of pole impacts and the severity of head and thorax injuries.

Mr Dalmotas suggested that the working group should address common problems, such as pole impacts and then specify a family of mobile deformable barriers that could be used to simulate different vehicle fleets for vehicle-to-vehicle simulation.

The Chairman further noted that an out-of-position test and a means to measure injury risk to children would be required.

Mr Kianianthra stated that the differences in vehicle fleets meant that the working group should avoid the development of detailed specifics for test procedures. He conceded that it may be possible to develop a detailed test specification for the most stringent ("worst case") scenario, but he warned of the possible complications of "over-specification".

Mr Kianianthra then said that IHRA should avoid involvement in near-term activities because the length of IHRA lead times and infrequency of meetings would make it impractical to achieve short-term targets.

The discussion then centred on the draft terms of reference.

Mr Kianianthra commented that the coordination of worldwide research and the improvement of EuroSID-1 to be used as a short-term harmonised dummy was to be conducted as soon as possible in conjunction with the EEVC. NHTSA would commit to this objective, and the IHRA could coordinate activities, but the IHRA should not be directly involved.

Mr Kianianthra pointed out that the IHRA would have the capability to recommend, but not commit members to a particular course of action, as the individual regulatory bodies are not bound by the IHRA.

Mr Lowne added that the IHRA Side Impact Working Group should focus on the development of a test procedure.

A Terms of Reference was drafted and circulated at the meeting (refer document SIWG16). Mr Newland was tasked with sending the agreed Terms of Reference to the IHRA Steering Committee.

DISCUSSION PAPERS

NHTSA

Mr Kianianthra presented an overview of the US side crash environment (document SIWG17). The presentation detailed the analysis of crash statistics and showed that the most injured body regions in side impact are the head and thorax. Most vehicle-to-vehicle and narrow object collisions occur at angles between 60° and 90°, with the most common pole impact speed between 15-20 mph.

In addition to the crash data information, Mr Kianianthra presented load cell barrier face results demonstrating the frontal stiffness distributions of the Dodge Neon and Jeep Grand Cherokee.

US INDUSTRY

Mr Hultman delivered a "Test Procedure Strawman" to the working group (document SIWG18). This draft procedure proposed specifications for a moving deformable barrier crash test, vehicle-to-pole crash test and out-of-position static tests for side impact air bags. This procedure generated some discussion, and the Chairman suggested that the document could best be used as a starting point for the generation of ideas and opinions. This will be undertaken in future meeting/s.

EEVC

Mr Lowne presented a paper (document SIWG19) consisting of extracts from a report of accident analyses compiled for the European Commission to review the side impact directive.

AUSTRALIA

Mr Seyer presented some results of a survey of the height above the ground of various components of a vehicle structure (document SIWG20). This survey of Australian vehicles showed that the front longitudinals were generally higher off the ground than the side sills, indicating that in vehicle-to-vehicle side impacts the front structure of the impacting vehicle would not engage the side structure of the struck vehicle.

EEVC

Mr Lowne presented the results of a parametric finite element modelling study conducted by Mervyn Edwards from Transport Research Laboratory (document SIWG21). The model simulated the impact of a mobile deformable barrier into the side of a small vehicle fitted with a EuroSID dummy. This model was then used to assess the injuries recorded by the dummy with variations in mass, stiffness, geometry of the barrier and impact velocity being investigated. A copy of this presentation was unavailable at the time. Mr Newland was requested to contact TRL to obtain this document.

VEHICLE DESIGN CHANGES RESULTING FROM SIDE IMPACT REGULATION

The Chairman then called for comments from the delegates regarding the changes in vehicle design resulting from current side impact regulations.

US INDUSTRY

Mr Hultman stated that all manufacturers meet or exceed the requirements of FMVSS 214, with designs developed to minimise the inadequacies of this regulation. He also stated that North American vehicles had enhanced structural and energy-absorbing side structures, however, designing vehicles for both the US and European regulations resulted in designs which are non-optimum for either regulation. These observations were attached as the last two slides to document SIWG 18, but are numbered separately as SIWG 22.

ACEA

Mr Justen had earlier provided written comment via email to the secretary. This document is numbered SIWG 23.

Mr Justen said that the European regulation requires a greater number of different countermeasures to achieve a good overall EuroSID response, due to the greater instrumentation levels in the EuroSID compared to the US SID.

Mr Justen provided a copy of a document summarising side impact test results for the Fiat Punto (SIWG 24), which generated some discussion. This vehicle meets both FMVSS 214 and ECE R95, however, it passes ECE R95 more comfortably. Mr Lowne was requested to seek CCIS accident data for this model and to request NCAP data for this vehicle.

JAMA

JAMA were unable to offer any comment as the information was considered proprietary.

EEVC

Mr Lowne noted that a vertical intrusion profile was beneficial for compliance with ECE R95. The time of initial acceleration of the pelvis is later with modern cars, compared with pre-ECE R95 vehicles. However, some manufacturers are making use of deficiencies in the design of the dummy. This includes the use of load paths which may not be registered in the abdomen and pelvis; the use of the engagement of the seat back on the dummy back plate; and the use of "pelvic pushers". This latter point is considered potentially dangerous because the permissible shear loads on the lumbar spine are unknown.

AAMA

Mr Hultman stated that as a result of the US FMVSS 214, manufacturers had generally stiffened the A and B pillars in order to fend off the barrier, which is an effective countermeasure for the barrier with uniform stiffness. However, this concept is not effective against the European barrier due to the non-uniform stiffness distribution. In this case, the barrier intrudes and there is a need to absorb crush in the door.

NHTSA

Mr Kanianthra commented that dummies are never perfect and design deficiencies may be susceptible to exploitation. He pointed out that the Nissan Sentra incorporated two cross car beams in order to comply with FMVSS 214. One of these was within the instrument panel and the other between the B pillars.

TRANSPORT CANADA

Mr Dalmotas agreed with Mr Kanianthra that dummies would never be perfect, however, he stated that a vertical intrusion profile across the widest range of crash conditions is desirable.

Mr Dalmotas presented some photographs showing the design concepts implemented in the doors of a number of test vehicles. The presence of "pelvic pushers" was noted and the need to apply sustained low loads on the pelvis, rather than punching the pelvis was highlighted. Mr Dalmotas was requested to supply copies of the photographs (on compact disc) to members of the group.

Mr Lowne was also asked to request similar photographs from Euro NCAP tests (if available).

Mr Dalmotas commented that early coupling minimised loads and permitted the application of a distributed load for the longest possible time, preferably via a vertical intrusion profile at the lowest possible velocity.

TEST MATRIX FOR IHRA SIDE IMPACT WORKING GROUP

TRANSPORT CANADA

Mr Dalmotas presented the Transport Canada test matrix designed to evaluate "emerging issues", concentrating on vehicle-to-vehicle crash tests (particularly LTV/SUV to passenger car), and side impact airbag evaluation using SID IIs, Q3 and Hybrid III 3-year-old dummies.

A copy of the test matrix was not available at the meeting. This document will be numbered SIWG 26 and circulated when available.

NHTSA

Mr Kanianthra was unable to provide a presentation during the meeting, but offered to supply a copy of the proposed test matrix to the secretary. This document will be numbered SIWG 28.

He summarised the NHTSA position by stating that they were supplementing and complementing the Canadian out-of-position (OOP) tests. NHTSA have also planned a series of full scale tests to evaluate EuroSID 2 with a view to incorporating this dummy into FMVSS 214.

JAPAN

Research from JMoT has been previously summarised (ESV Melbourne). JMoT has introduced ECE R95 and is currently happy with this situation.

If JAMA traffic research shows a need for testing, or if the IHRA prompts some ideas, a cooperative test program could be developed between JMoT and JAMA in the next fiscal year (commencing April 1999).

ACEA

Mr Justen stated that ACEA has no current side impact research plans. European manufacturers are concentrating on pole impact test development and FMVSS 201. ACEA would need to discuss the AAMA Test Strawman presented by Mr Hultman.

OSRP

OSRP is evaluating the Q3 and Q6 child dummies in conjunction with NHTSA. Ford also intend to evaluate the Taurus and Mustang to ECE R95 with EuroSID 2 in order to determine if the "rib flat-topping" and "knee clank" concerns have been addressed.

EEVC

The EEVC are concentrating on a barrier face evaluation program and development of an interior headform test.

The EEVC are also considering increasing the test speed to beyond 50 km/h for ECE R95.

Mr Lowne indicated that the EEVC would still like to pursue the originally proposed test matrix (refer SIWG 11), attempting to determine the design changes resulting from vehicle regulations.

Mr Hultman interjected that it would be too premature to conduct this test matrix, however, Mr Lowne reiterated the need to learn from this basic research. NHTSA were not interested in exploring functional equivalence or comparing ECE R95 and FMVSS 214. They were also concerned about the selection of vehicles for these tests and the validity of such a small number of tests.

ACEA offered support, stating that they were happy to conduct mobile deformable barrier tests, but would wish to assess the results prior to committing to car-to-car tests.

Japan were willing to support the test matrix, but not financially, due to budget constraints.

Australia and Canada both supported the test matrix.

It was suggested by the EEVC and Transport Canada that the test matrix should be considered as an information gathering exercise to look at the response of vehicle manufacturers to two different regulations and to try to learn from this experience when developing a new regulation.

Mr Lowne proposed that the IHRA Side Impact Working Group endorse the test matrix, with reservations from certain members if necessary, in order for the group to undertake some test activities and make some progress.

It was resolved that the IHRA Side Impact Working Group would endorse the test matrix, with reservations from NHTSA, who were concerned that the test vehicles were not representative of the US fleet and the test matrix objectives were unclear. Mr Lowne was tasked with drafting objectives for this item for the next meeting.

AUSTRALIA

Mr Newland presented an outline of a side impact test series to be conducted by FORS to parametrically study the effects of mass, stiffness and geometry of the impacting mobile deformable barrier (SIWG 27). The tests will be conducted using BioSID and SID IIs dummies from Transport Canada, and using an Australian vehicle, the Ford EL Falcon as the target car. The results of this study are due to be presented at the next meeting.

NEXT MEETING OF IHRA SIDE IMPACT WORKING GROUP

It was agreed to hold the next meeting of the working group in conjunction with meetings of the international Standards Organisation in Japan. The IHRA Side Impact Working Group will met again on the 17th and 18th of May 1999 in Kyoto, Japan. The venue to be advised.

MEETING CLOSED.

CRAIG NEWLAND
30 July 1999